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AUTHOR Dierks, Caroll J.
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ABSTRACT

The Automated Instruction Touch Typing System, an individualized self-paced instructional method of teaching typewriting skills using the principles of response conditioning, was evaluated. The system is divided into four phases. Phase 1 presents keyboard instruction in four to six hours. These lessons are response conditioning sessions during which students react to visual and audio signals. Twelve color motion picture film cartridges, listening stations, headsets, and cassette tapes are used. Phase 2 provides instruction for increased finger dexterity, speed, and accuracy. The lessons include controlled copytyping, reinforcement, and word response exercises as well as individualized speed analysis exercises. Phase 3 places emphasis on the number keys whereas phase 4 covers the aspects of production typing in a modular self-paced instructional design. The system was tested by comparing the progress of eight seventh and eighth graders using it with a control group of equal size using a traditional method of instruction. After six weeks of instruction both the increase in gross words per minute and errors per minute were greater in the experimental group. However, teachers and students did identify some advantages of the automated system. It allows students to move at their own pace. In addition, most students responded positively to the privacy and noncompetitive learning situation. (BB)

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Evaluation of an Automated Touch Typing System

Caroll J. Dierks

Typewriting instruction almost universally falls into three categories: keyboarding skill, speed and accuracy development, and production typing skill. Typewriting has become a generally used skill in numerous business occupations with keyboarding skills serving as a foundation in many occupational areas: clerical, stenographic, machine transcription, keypunching, word processing, and the like. Eighty-five percent of all positions open to high school graduates that required any skill required typing skill.

Instruction in and development of typewriting skills are found in all Colorado secondary vocational business and office education programs. This exemplary project was proposed for research to examine one alternative method for teaching typewriting skills--research to field test the Automated Instruction Touch Typing System marketed by Random House, Incorporated.

The Automated Instruction Touch Typing System is an individualized self-paced instructional method of teaching typewriting skills using the principles of response conditioning.

The Automated Instruction System is divided into four phases. Phase I presented keyboard instruction in four to six hours. These lessons were response conditioning sessions during which the student reacted to visual and audio signals. Software included 12 color motion picture film cartridges; the hardware included projectors, screen, mini-theater, listening stations, headsets, and cassette tapes.

Caroll J. Dierks is an Assistant Professor of Business and Vocational Teacher Education at the University of Northern Colorado. *She served as Project Coordinator and wishes to express a special thanks to Mr. Dean Crosier, Principal, Valley High School, Gilcrest; Ms. Verda Bostrom, Business and Office Education Instructor; and all of the students from Valley High School who participated in this research study.*

Appreciation is also expressed to the students at the Laboratory School at the University of Northern Colorado, Greeley; and to Dr. Ken Frisbie, Director, Laboratory School; and Mrs. Rozema McKain and Ms. Jeanne Lipman who taught the Automated Instruction Touch Typing System used as the basis for this research study.

Phase II provided instruction for increased finger dexterity, speed, and accuracy. The lessons included controlled copy-typing, reinforcement, and word response exercises as well as individualized speed analysis exercises.

Phase III placed emphasis on attaining speed and accuracy on the number keys with Phase IV covering the aspects of production typing in a modular, self-paced instructional design.

Rationale

West (7) reports in the monograph, "Implications of Research for Teaching Typewriting," that traditional instructional materials and methods for acquiring stroking skill suffer from several misconceptions about the process both with regard to typewriting itself and the fundamental principles for the acquisition of (any) skill.

"The process of acquiring typing skills involves mastery over a series of stroking habits whose levels or orders are defined by the number of consecutive motions that may be made without conscious attention to each motion in the series." (7)

He continues that the two chief instructional implications of the acquisition of stroking skills are:" (1) Stress on stroking speed, not accuracy, is the necessary condition for the efficient development of the chained responses that define skill and (2) eliminate inaccurate verbiage about typing 'by syllables' on the word (or phrase) level." (7:3)

Further implications are reported by West (7:3-4) concerning the vocabulary of practice materials and the role of repetitive practice. He concludes that, "During keyboard learning and any stroking skills practice that is untimed, extensive practice over a varied body of materials is preferable to intensive practice over a varied body of materials." The alternative method (automated instruction) for teaching typewriting studied in this project utilized a conditioned-response approach. The student sees, hears, and reacts in learning keyboard skills.

At the present time, limited research has been completed to measure the effectiveness of the AI System. Studies have been

completed by Dupras and Clerkin comparing the skill development of students taught by the traditional method and by the Automated Instruction Touch Typing System. Dupras (4) has specifically compared speed and accuracy achievements of high school students and found that for her studies, the Automated Instruction System was definitely associated with higher speed achievements (almost 19 percent higher for the experimental group after 15 weeks of instruction measured on straight-copy material).

Clerkin's (1) study measured production performance on three different classes of tests: One on business letters, one on manuscripts, and one that covered tables and outlines. In summarizing the production test results from Clerkin's study, it was found that the automated instruction group, as a whole, had a higher mean on all three tests. The difference ranged from about 3 percent on the letters to more than 9 percent on the tables.

Purpose

The purpose of the project was to test the Automated Instruction Typing System for future consideration and implementation in schools throughout Colorado by examining several concerns:

1. What was the effectiveness of the Automated Instruction System in achieving speed and accuracy skills?
2. What was the effectiveness of the Automated Instruction System in developing production typing skills?
3. What were the considerations for pre-service business teacher education?
4. What were the implications for in-service education?
5. What were the modifications/applications needed for other classrooms in Colorado?
6. What were the students' perceptions of the Automated Instruction System?
7. What types of teacher skills were needed in order to use the Automated Instruction System?

Procedure

As no secondary vocational business and office education program in Colorado was using the Automated Instruction Touch Typing System for the teaching of typing skills, a decision was made to field test the Automated Instruction System at the Laboratory School at the University of Northern Colorado. In the spring of 1975 the following individuals met to discuss and examine the feasibility of establishing an experimental project at the Laboratory School:

Mr. James Wilson, Assistant Director, State Board for Community Colleges and Occupational Education

Dr. Richard Edsall, State Board for Community Colleges and Occupational Education

Ms. Carol Vote, State Supervisor, Business and Office Education, State Board for Community Colleges and Occupational Education

Dr. Ken Spooner, the University of Northern Colorado

Dr. Ken Frisbie, Director, Laboratory School, the University of Northern Colorado

Mrs. Rozema McKain, Instructor, Business Department, Laboratory School, the University of Northern Colorado

Three faculty members, School of Business, the University of Northern Colorado

Four members, State Vocational Business and Office Education Advisory Committee

Following the discussion and further study, a proposal was submitted to the State Board for Community Colleges and Occupational Education and approval was given. This project was designed to determine the effectiveness of an alternative method of teaching typewriting skills with the Automated Instruction Touch Typing System. Students in the typewriting classes at the Laboratory School at the University of Northern Colorado were designated as the experimental group receiving instruction from the Automated Instruction System. Students from Valley High School at Gilcrest, Colorado, enrolled in beginning typewriting classes were designated as the control group as they most nearly matched in grade level and length of class periods the experimental group at the Laboratory School. In addition, students enrolled in beginning typewriting from middle school were given the tests, even though it was not possible to have a matching control group with which to make comparisons. Skill development of middle school students will be included in the results, but not on a comparative basis.

Students in the control group were taught by a qualified business and office education instructor. The textbook used was *Typing 300*, Fifth Edition by Rowe, Lloyd, and Winger, published by Gregg Division, McGraw-Hill Book Co., copyright 1972.

Students from both the control group and experimental group were tested on straight-copy timings for speed and accuracy comparison and on a production performance test. Students were given straight-copy timings every six weeks. Both groups were given the same copies and directed to type one 1-minute and one 3-minute timing test on which scores of speed and accuracy have been recorded and will be reported in the results section of this paper.

Material for the straight-copy timings were taken from *10: Typewriting Timings With Selected Drills*, Third Edition by James M. Thompson, published by Southwestern Publishing Company, 1971.

Test difficulty of straight-copy material varies with the characteristics of the copy. Research has found that the ease with which copy can be typed is influenced by three factors: syllabic intensity (SI), average word length (AWL), and high-frequency words (HFW)--words used from among the thousand most-used words in business communications. For the vocabulary of written business communication, the true mean value for syllabic intensity is 1.54 or 1.57 within the average range. West (7:31) reports, "If straight-copy scores from one occasion to the next are to represent true measures of change in skill toward the requirements of later-life typing, the materials for all straight-test copy timings after keyboard presentation should center closely around a syllabic intensity of 1.54 or average word length of 6.0.

The timings chosen to measure straight-copy skill for speed and accuracy reflect consistency with this recommendation. With the exception of 1-A and 1-B, the materials used represent 1.5 syllabic intensity, 5.6 average word length, and 75 percent high-frequency words. The timings labeled 1-A and 1-B were given during the sixth week of instruction and they represent a 1.4 syllabic intensity, 5.4 average word length, and 80 percent high-frequency words. All timings were selected randomly within the range that met the syllabic intensity and average word length requirements for written business communication.

The production skills test selected was the Science Research Associates, Typing Test. This test was developed by Steven J. Stanard and LaVonne A. Macaitis, specifically labeled SRA Typing 5, copyright 1975. The SRA Typing 5 tests were designed to provide a measure of a person's ability to type a particular kind of assignment. Since an employer may have typing positions that require many different typing skills, a set of tests that reflected the different typing skills were given that included: Form A--typing speed, Form B--business letters, and Form C--numerical. These different tests were an attempt to meet the needs of a variety of test users for an employment test. The determination of the test content was based on syllabic intensity, average word length, and high-frequency words. Form A, which measured typing speed, had a 1.63 syllabic intensity, 4.39 average word length, and 86 percent high-frequency words; Form B, which was production of a business letter, represents 1.56 syllabic intensity, 4.08 average word length, and 83 percent high-frequency words; and Form C, which was numerical but did include the production of a letter combined with the table, was 1.45 syllabic intensity, 4.05 average word length, and 93 percent high-frequency words.

SRA Typing 5 presented norms on all three parts of the test comparing office applicants and inexperienced office applicants, nationally and by region. These norms were collected from approximately 25 organizations and branch offices throughout the country. See the results section for a comparison of the test of the secondary students test norms.

Speed and accuracy scores should be interpreted separately. Both the control and experimental groups took this test at the end of the first semester and at the end of the second semester. The test provides standardized instructions and materials as well as standarized scoring which was translated as a percentage score for comparison with the norms provided by the authors of the SRA Test 5. A comparison of the scores is reported in the results section.

Typewriting courses scheduled at the Laboratory School during the 1975-1976 school year were offered as electives for one or two semesters of instruction for grades 9-12. However, typing instruction was required of all seventh graders for nine weeks.

With the exception of eight students in the experimental group, all others enrolled in the first semester typing had received previous instruction varying from 6 weeks, 9 weeks, 18 weeks, and in a few cases more than 18 weeks. Of the eight beginners enrolled in the Laboratory School typing program, two enrolled in a second semester of instruction. Eight additional beginners enrolled in second semester typing with automated instruction systems.

All students receiving instruction in the control group were beginners with no previous typing instruction. In order to make comparisons on skill development, only eight randomly selected control group students were chosen for the study with an attempt to match age, grade level, and sex factors for comparing results with the eight beginners from the experimental group.

Due to the small number (eight) used for comparison in each group, the results of the skill development should not be interpreted as having statistical significance.

Additionally, the number of uncontrollable variables made an interpretation of the results statistically impossible; implications and interpretations are possible and the results and recommendations follow.

An attitude scale was given to the students in both the first and second semester experimental groups. The attitude scale used was adapted from a study by Neidt (6) in which the scale measured student attitudes towards methods of instruction, content of instruction and course expectations. The general format of Neidt's scale was not changed; only items that referred to a specific course title were edited.

Additional reactions were gathered from students in the experimental group using the Laboratory School Teacher and Course Evaluation form as well as asking for student reactions in narrative form.

Dissemination of information concerning this exemplary project was handled in a variety of ways throughout the school year. An article appeared in the fall in the State Board for Community Colleges and Occupational Education, Business and Office Education Section Newsletter; two articles appeared in the *Greeley Tribune:* August 13, 1975 and February 26, 1976; and an article in the April, 1976, CVA Newsletter; a presentation/participation workshop was given for teachers during the annual University of Northern Colorado Mid-year Conference; a presentation was scheduled for the Colorado Business Education Association Western Regional Meeting, two news releases were mailed to the *Platteville Herald* and the *LaSalle Leader* as well as the Valley High School school paper; and the final results were presented during the August, 1976, Annual Vocational Education Workshop.

Findings

Results are available for this study on both straight-copy typing speed and accuracy production performance tests and students' and teachers' attitudes and perceptions of the Automated Instruction Touch Typing System.

It was not possible to conduct this field test under controlled experimental conditions--factors such as the difference of the experimental group learning with electric typewriters and the control group learning with manual typewriters and limited access to electrics; the length of instruction; the fact that middle school typing instruction is given in both the seventh and eighth grades at the Laboratory School and the students in the control group do not receive any instruction in typing until grade nine; the study was limited to Weld County and it was not possible to match IQ, dexterity, sex, teacher, classroom, equipment, age, grade level, vision and hearing, previous instruction; these factors placed a definite limit on the interpretation of the typing skill results.

However, the major impact of the findings can be found in the methodology used, student reactions to this automated method of instruction, curricular implications for the development of typing skill as well as a look to the future for pre-service and in-service considerations.

The following tables (1 - 3) summarize the average speed (gross words per minute) and the average number of errors per minute for the students from the experimental group who had no previous instruction in typewriting. The eight students from the experimental group were matched with eight students from the control group as closely as possible with age, grade level, and sex. Due to the small number being compared, the results of straight-copy speed and accuracy scores should not be interpreted as having statistical significance.

In summarizing one-minute straight-copy speed, the con-

trol group increased from the first 6 weeks of instruction from 15.8 gross words per minute (GWPM) to 30.6 GWPM or an increase of 14.8 GWPM while the experimental group increased from 18.5 GWPM to 38 GWPM for an increase of 19.5 GWPM. Accuracy scores reflect a higher degree of accuracy for the control group as shown by an average of 1.14 errors per minute for the first six weeks compared with 1.87 for the experimental group. The comparisons between the groups showed the control group increasing errors per minute (EPM) by .69 while the experimental group increased EPM by 1.63. Even though gross words per minute increased with the automated instruction so did the errors per minute. (See Table 1 and Graphs)

One-Minute Skill Development
Comparison: 1st Six Weeks With 3rd Six Weeks

	Speed	Accuracy
Control	+ 14.8	+ .69
Experimental	+ 19.5	+ 1.63

Average scores for three-minute straight-copy timings show the control group increasing speed from 14 GWPM to 25.1 GWPM for an increase of 11.1. The experimental group increased from 20.2 GWPM to 32.8 GWPM or 12.6 GWPM improvement. Accuracy scores on the three-minute timing reverse the trend shown on the one-minute timings with the experimental groups increasing errors per minute by 1.13 and the control group, 3.76.

Three-Minute Skill Development
Comparison: 1st Six Weeks With 3rd Six Weeks

	(Speed)	(Accuracy)
Control	+ 11.1	+ 3.76
Experimental	+ 12.6	+ 1.13

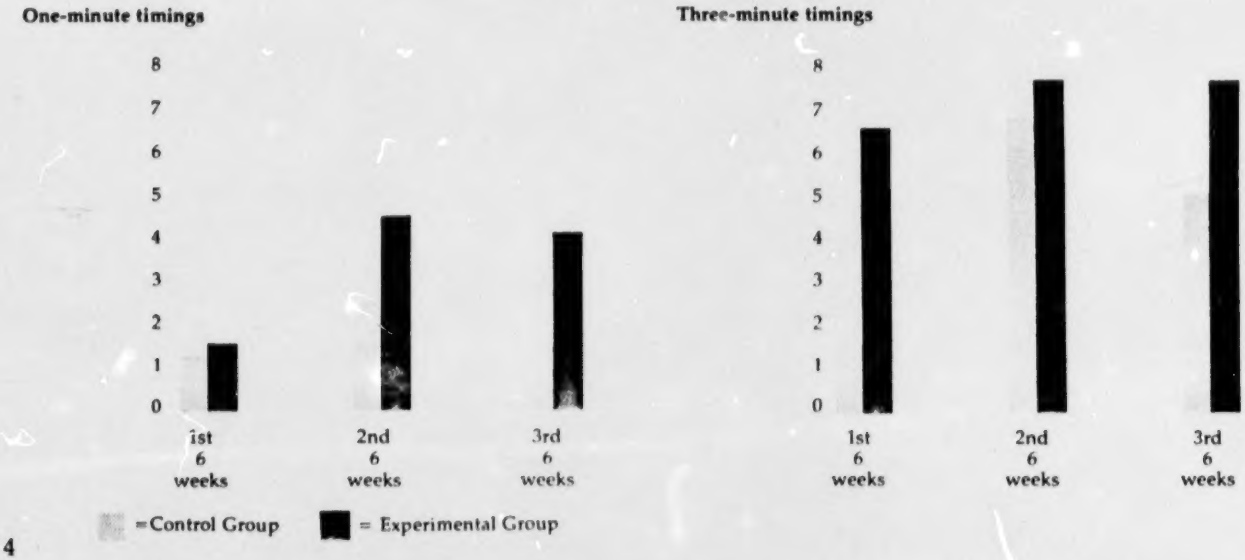
An additional comparison was made with the six beginners in the second semester in the experimental group with six selected students from the control group. A match of these six students was attempted based on age, grade level, and sex. The

TABLE 1. Comparison of beginners' straight-copy timings.

	1st 6 weeks				2nd 6 weeks				3rd 6 weeks			
	Control Group*		Experimental Group*		Control Group*		Experimental Group*		Control Group*		Experimental Group*	
	One-Minute	Three Minute	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute
Speed (Gross Words Per Minute)	15.8	14.0	18.5	20.2	28.8	22.8	26.1	28.0	30.6	25.1	38.0	32.8
Accuracy (Average Errors)	1.14	1.57	1.87	6.50	2.87	6.75	4.50	7.66	1.83	5.33	3.50	7.63

Average scores reported for the matched beginners' group.

Beginners' Summary of Straight-Copy
Group Average Accuracy



results at the end of 18 weeks of instruction are as follows: (See Table 2).

One-Minute Skill Development
Comparison: 1st Six Weeks With 3rd Six Weeks

	Speed	Accuracy
Control	+ 21.0	+ .66
Experimental*	+ 13.3	-1.00

**Second semester beginners who had no previous instruction in typing.*

Comparison: 1st Six Weeks With 3rd Six Weeks

	Speed	Accuracy
Control	+ 15.3	+ 3.73
Experimental*	+ 12.5	+ 1.10

**Second semester beginners who had no previous instruction in typing.*

With such small samples, one cannot generalize these results and conclude that either the traditional textbook method or the Automated Instruction System produces faster and/or more accurate typists for straight-copy typing.

As an interesting note, the eighth grade students who enrolled in typewriting this year also were taught with the Automated Instruction System. All of the eighth graders had received twelve weeks of instruction in typewriting as seventh graders. These eighth graders received the equivalent of 18 weeks of instruction even though they met for the entire school year. Their instruction was scheduled for alternate days of instruction. The results of their speed and accuracy performance on both one- and three-minute straight-copy timings were as follows:

Eighth Grade: Speed and Accuracy

	Dec. 4, 1975	Jan. 6 1976	June 1, 1976
One-minute			
Speed	26.9	23.90	39.80
Accuracy	4.4	4.05	4.86
Three-minute			
Speed	25.4	23.70	36.30
Accuracy	12.7	11.52	13.06

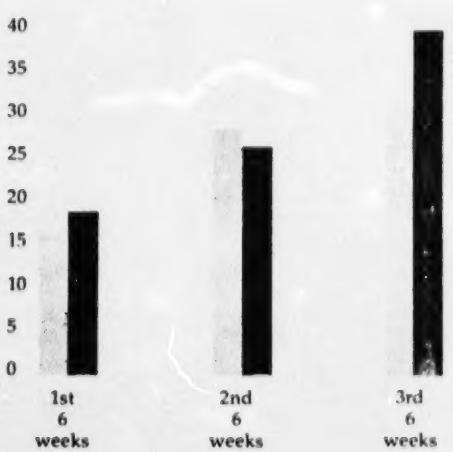
TABLE 2. Comparison of Beginners' straight-copy timings. (18 Weeks' Instruction)

	1st 6 weeks				2nd 6 weeks				3rd 6 weeks			
	Control Group		Experimental* Group		Control Group		Experimental* Group		Control Group		Experimental* Group	
	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute
Speed (Gross Words Per Minute)	19.0	17.0	19.3	15.5	29.2	26.0	26.6	24.1	40.0	32.3	32.6	28.0
Accuracy (Average Errors)	1.50	5.60	5.60	9.20	1.80	5.20	3.00	6.00	[illegible]	9.33	4.60	10.30

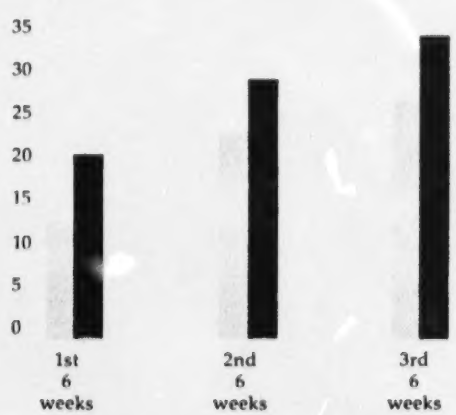
**Second semester students who had no previous instruction in typewriting.*

Beginners' Summary of Straight-Copy
Group Average Speed

One-minute timings
(Gross words per minute)



Three-minute timings
(Gross words per minute)



Results for the beginners who completed 36 weeks of instruction in the experimental group were matched with the control group, and the control group recorded an increase of 24 GWPM for one-minute, and the experimental group increased 10.5 GWPM in comparing speed and accuracy scores from first semester to the end of the second semester.

Both groups increased errors by 3.5 EPM. For a three-minute timing, the control group increased 16.5 GWPM and the experimental group 13 GWPM; however, the control group increased errors per minute by 8.5, and the experimental group showed only a 2 EPM increase. (See Table 3.)

Comparison of Beginners' Straight-Copy Timing
End of 36 Weeks Instruction

	Speed		Accuracy	
	One-Minute	Three-Minute	One-Minute	Three-Minute
Control	+ 24.0	+ 16.5	+ 3.5	+ 8.5
Experimental	+ 10.5	+ 13.0	+ 3.5	+ 2.0

Performance on the SRA Typing 5 Test measured speed and accuracy skills on production problem typing. The test consisted of three parts entitled Form A, Form B, and Form C. Form A was designed to measure basic typing speed and keystroking ability; Form B, business letter typing; and Form C, business letter typing combined with numerical, columnar typing.

All three forms of the test are of average difficulty or easier in terms of average word length.

In comparing the control and experimental beginner groups at the end of eighteen weeks of instruction, the group averages for Form A, B, and C are:

	Form A		Form B		Form C	
	Speed	Accuracy	Speed	Accuracy	Speed	Accuracy
Control	21.61wpm	91.61%	18.00wpm	91.69%	12.53wpm	82.92%
Experimental	23.83wpm	86.25%	17.75wpm	83.00%	14.58wpm	31.25%

The group averages for speed on all three forms of the test fall below the fifth percentile rank in the table of norms established for experienced and inexperienced office applicants--that means that 95 percent of the applicants scored higher than these two typing groups when their scores were averaged.

The students scored much higher in the percentile rank on each of the forms of the test. The following table shows the percentile rank for each form of the test:

	Form A		Form B		Form C	
	Accuracy	Percentile Rank	Accuracy	Percentile Rank	Accuracy	Percentile Rank
Control	91.61%	45	91.69%	39	82.92%	23
Experimental	86.25%	32	83.00%	30	81.25%	22

Refer to Table 4 for the Beginners' Control Group and Experimental Group Production Test Scores on Forms A, B, and C of the Science Research Associates Typing 5 Test.

For a concise summary taken from the California Business Education Journal of the results of controlled experiments from 1960 to 1973 using pacing devises, the reader is referred to Dupras, Arline S. "Report of an Experiment Using 'Automated Instructions' to Teach Beginning Typewriting," *California Business Education Journal, 1975, p. 14.*

How effective was the Automated Instruction Touch Typing System in developing speed and accuracy skills and production typing skills? With the limited number of beginners and the wide variation in other factors, a defensible conclusion cannot be reached concerning the skill development levels; however, teachers and students alike have identified advantages that are not measured on a "speed or accuracy yardstick."

"The method of instruction (self-pacing) allows the fast student to move as fast as he/she can--the Automated Instruction System allows the student to move at his/her own comfortable pace!" This statement was made by one of the instructors using the Automated Instruction System. "It is a process-oriented program which has a major strength--the multi-media approach for the multi-levels of learning."

Most students responded positively to the privacy and non-competitive learning situation in which they were developing their typing skills. They preferred to work on their own without being pressured and they felt a freedom to come in on their free time and continue to move ahead. (This was especially true of the eighth grade students.)

The student reaction to individual projects was positive. As an example, one student states, "Comparing this type of instruction to the instruction I received in junior high, I feel I've learned a great deal more in this class by being able to work independently of others."

The major criticism from students appears to center around the use of the tapes as the following comments show: "Perhaps if you had a few breaks to help relieve the boredom of the tapes." "Throw away the tape recorders." However, another student reacts, "I think the tapes are good because you can work at your own speed."

TABLE 3. Comparison of beginners' straight-copy timing. (End of 36 Weeks' Instruction).

	4th 6 weeks				5th 6 weeks				6th 6 weeks			
	Control Group		Experimental Group		Control Group		Experimental Group		Control Group		Experimental Group	
	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute	One-Minute	Three-Minute
Speed (Gross Words per Minute)	53.5	41.5	46.5	39.0	57.0	36.0	45.0	38.0	54.0	47.0	49.5	46.0
Accuracy (Average Errors)	2.0	6.0	1.5	8.0	3.0	3.0	1.5	6.0	4.5	11.5	4.5	8.0

TABLE 4. Production test scores. (18 Weeks' Instruction)

Control Group

Student No.	Typing Speed Form A Speed*	Typing Speed Form A Accuracy+ %	Business Letter Form B Speed*	Business Letter Form B Accuracy+ %	Numerical Form C Speed*	Numerical Form C Accuracy+ %
C 1	30	92	25	88	21	97
C 2						
C 3	18	88	16	93	13	93
C 4	16	96	13	93	10	88
C 5	27	90	21	93	8	55
C 6	1[illegible]	81	12	86	9	84
C 7	24	94	19	99	14	93
C 8	13	97	14	93	10	86
C 9	17	94	15	94	8	62
C10	36	98	29	95	21	94
C11	14	85	13	88	9	66
C12	28	92	12	87	14	93
C13	21	90	19	91	8	81
C14	26	94	26	92	18	86

Experimental Group

E 1	30	88	21	89	21	95
E 2	25	91	22	87	19	87
E 3	26	84	15	80	16	75
E 4	22	84	20	83	12	73
E 5	25	94	22	95	15	90
E 6	27	91	16	81	19	91
E 7	29	94	20	87	19	93
E 8	23	81	14	73	8	66
E 9						
E10						
E11	16	69	15	72	11	70
E12	22	82	19	82	15	74
E13	18	87	13	85	8	71
E14	23	90	16	82	12	90

* *Gross Words Per Minute*
\+ *Expressed as a percentage*

Another factor to which students reacted concerns projects: "Make directions for projects more clear." "By having more instruction; the cards don't give enough. It was a good program." "Have more activities; such as, 'a day on the job,' more class involvement, those projects get 'real old' after a year, and more office work."

The Automated Instruction System provides a method of taking a student where he is and of meeting his needs for learning and developing typing skill.

The teachers who field tested the Automated Instruction System this year at the Laboratory School reacted to the time demands on the teacher in this situation. In the beginning there is an overwhelming amount of "things" to know about and to be able to handle and answer questions about. As with any individualized instruction system, a teacher must be able to answer any question of any phase in the learner's situation. Undoubtedly, after the first time "learning" to work with the system, the teacher will be more comfortable with each successive term of instruction.

The system "demands" that every student's paper be checked, evaluated, and/or recorded every day so progress and diagnosis of needs can be made. There is definitely a need for an assistant; either a paraprofessional or student to handle the routine daily handling of papers and equipment.

The project teachers reported the need to use the supplementary Project File cards--not as supplementary, but as part of the regular assignments as there was not enough material for instruction on many of the Project File cards. A strong concern was voiced in the area of accuracy--as it did not appear that much emphasis was placed on accuracy and no specific training was given in proofreading skills. Certain other inaccuracies and omissions were noted by the project teachers.

The Automated Instruction Touch Typing System has proved to be a big advantage in recruitment at the Laboratory School. Because of the flexibility of the system which allows any student with any level of typing skill to enroll at any time, enrollment has jumped dramatically. During the school year 1974-1975, thirty-four students from grades 9-12 represented the total number enrolled in typewriting; in 1975-1976 (implementation of the Automated Instruction System) more than 100 students enrolled, with every typewriter filled; the same number is scheduled for enrollment in 1976-1977.

The entire business and office education program is benefitting from the impact of the automated, self-paced approach to learning typing.

Available to pre-service business teacher education majors is a pre-student teaching clinical experience in the Laboratory School under the supervision of Mrs. Rozema McKain and Ms Jeanne Lipman. Two quarter credit hours are available to students registering for EDFE 363: INTRODUCTION TO TEACHING: BUSINESS. Several students participated in EDFE 363 during 1975 - 1976 and received practical, "hands on" experience with the Automated-Instruction System as well as a real look at the pros and cons of individualizing instruction. The implication for pre-service preparation are mainly that of structuring and involving more future business teachers in learning to use methods and equipment that allow for self-pacing and individualization.

Close cooperation from instructors of methods classes in the School of Business this year has resulted in both a better prepared pre-service student and a stronger spirit of cooperation between the Laboratory School and the School of Business in meeting student needs.

It may be possible that pre-service activities related to the Automated Instruction System can be expanded to workshop or seminar activities offered to students attending other institutions.

On June 2, 1976, at the Laboratory School, Business and Office Education Advisory Committee Meeting, a discussion was held to identify the possible in-service activities that could be made available to business teachers. Workshop(s) will be planned for the summer of 1977 utilizing the Automated Instruction System for instruction.

The importance of the teacher cannot be overstated or overemphasized in the teaching-learning process. The skills of the teacher are very important to the learning outcomes--whether the method used is textbook or an automatic, self-pacing, mechanical process.

References Cited

1. Clerkin, William J. *A Comparative Study of the Automated-Instruction Touch-Typing System With the Traditional Method of Teaching Beginning Typewriting*. Research Report, University of Wisconsin, 1974.
2. Cook, Fred S. and Frank W. Lanham. *Opportunities and Requirements for Initial Employment of School Leavers With Emphasis on Office and Retail Job*. USOE Project No. 2378, 1966.

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